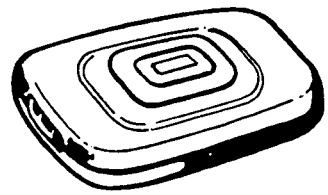
PIONEER®
The Art of Entertainment

Service Manual



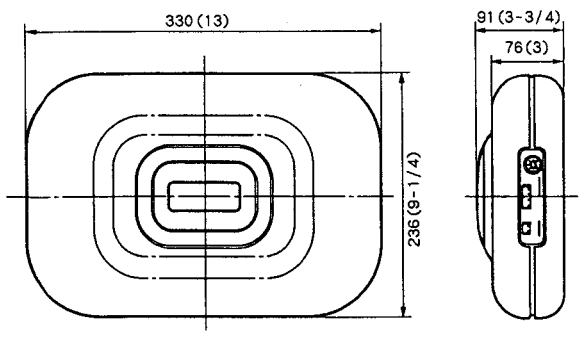
ORDER NO.
TRT1021

SURFACE-MOUNT TUNE-UP WOOFER SYSTEM

TS-LX80 EW

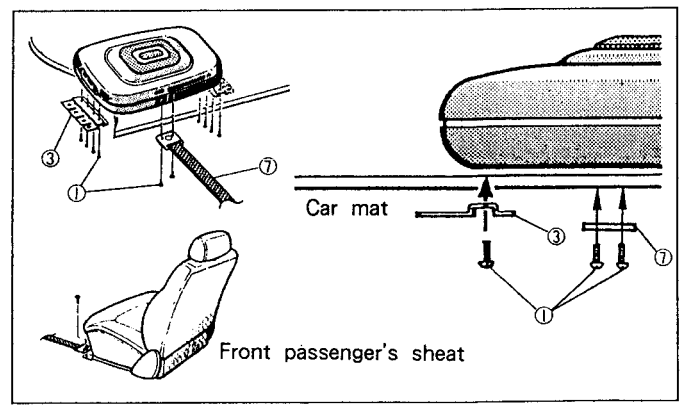
1. SPECIFICATIONS

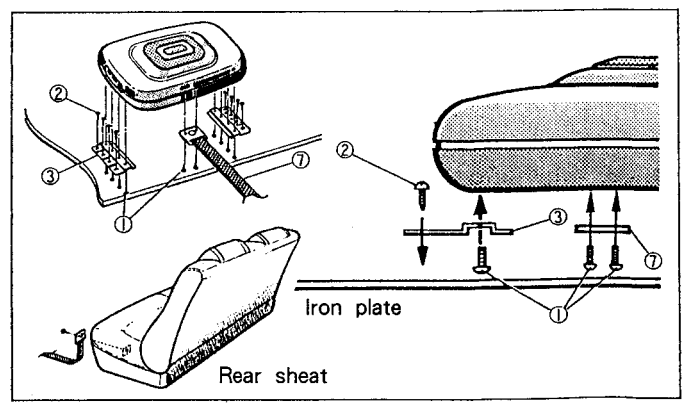
- Speaker specifications
  - Size ..... φ160mm (6-1/2" Dia.)
  - Injection-molded polypropylene cone
  - High compliance, rolled edge
  - Heat-resistant voice coil
  - Strontium magnet : 380g (13.5 oz)
- Amplifire
  - Max. power output 80W
  - Input level (DIN) ..... 15mV + 15mV/47kΩ (at GAIN Max.)
  - (Speaker line) ..... 1.5V + 1.5V/22kΩ (at GAIN Max.)
  - Power source ..... DC14.4V (10.8 – 15.6V allowable)
  - Grounding ..... Negative ground
  - Max. current consumption ..... 7 A
- Speaker system ..... Sealed type
- Cabinet material ..... High density compound resin
  - Aluminum die cast
- Size ..... 330mm (W) × 236mm (D) × 91mm (H)
- Weight (including accessory parts) ..... 4.2kg (9 lb 4 oZ)
- Gross weight (including packaging) ..... 4.6kg (10 lb 2 oz)



Unit : mm (in.)

2. HOW TO INSTALL





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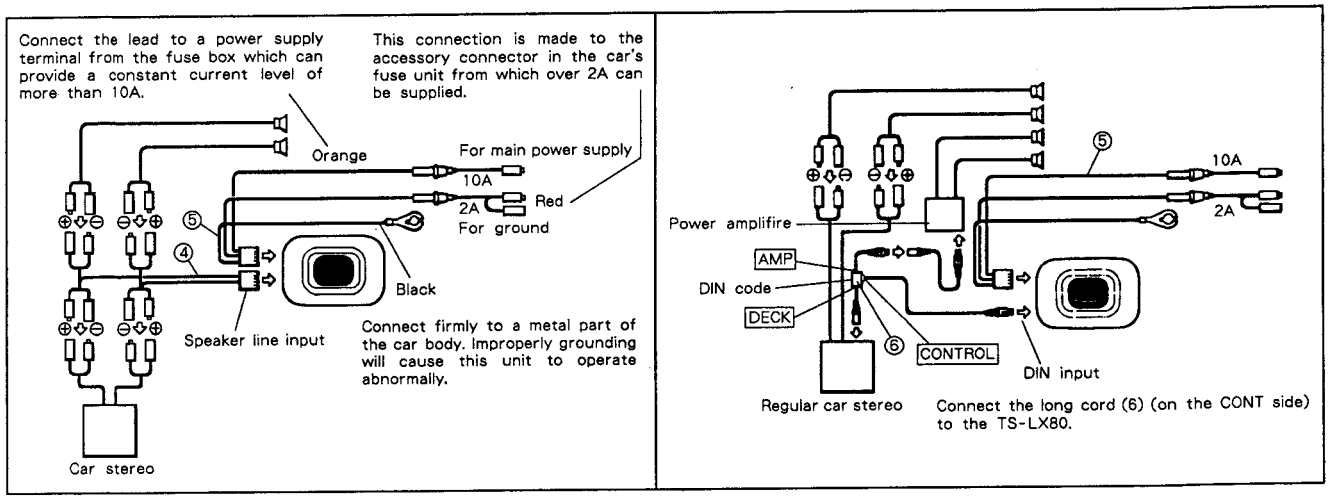
I DEC. 1990 Printed in Japan

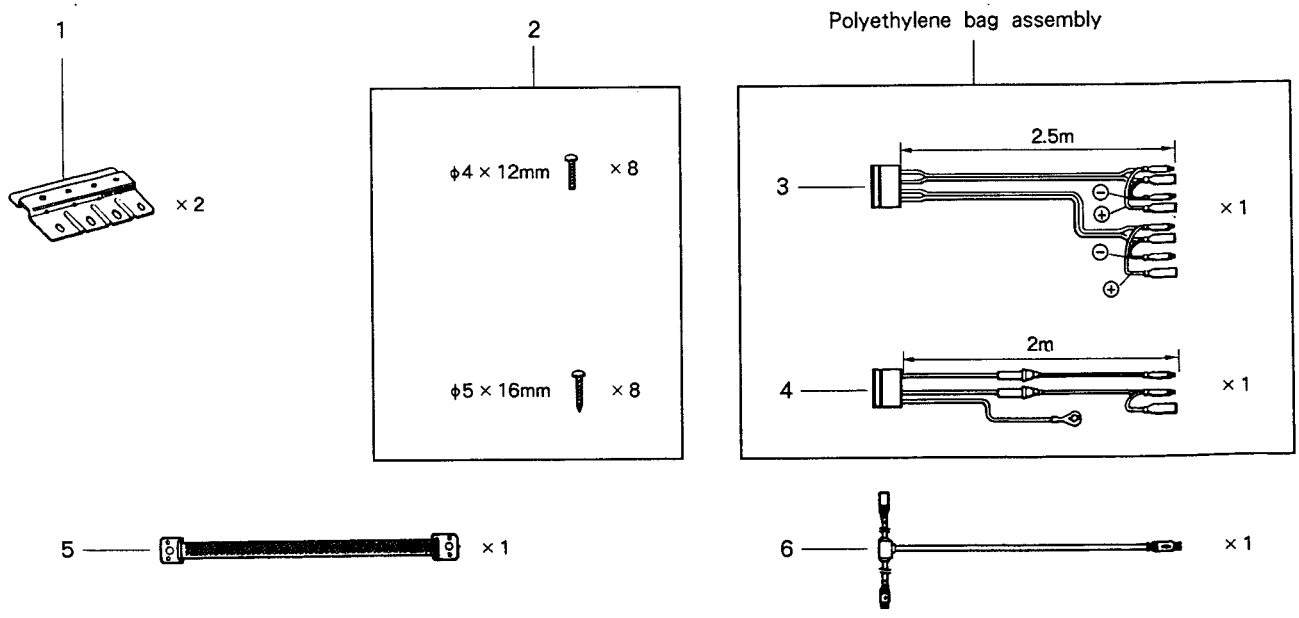
3. CONNECTIONS



4. PARTS LIST OF PACKING

No.	Description	Part No.	Remarks
1	Holder	TNA1088	× 2
2	Parts bag	TEA1249	× 1 Screws
3	Cord	TDC1309	× 1
4	Cord	TDC1421	× 1
5	Belt	TNA1203	× 1
6	DIN cord	TDE1004	× 1
	Styrofoam protector	TEC1355	One pair
	Packing case	THF1583	× 1

● Including parts



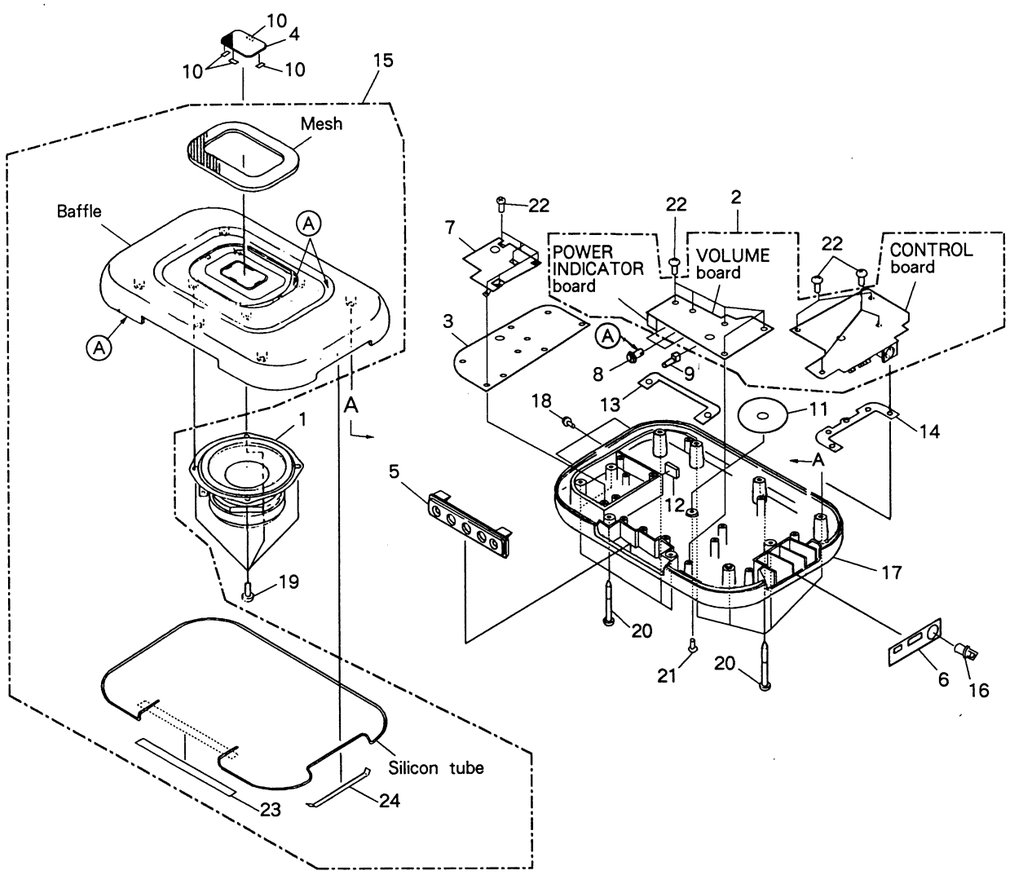
5. EXPLODED VIEWS AND PARTS LIST

NOTES :
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Parts List

No.	Description	Part No.	Remark
1	Woofer	16-437AZ	× 1
◉ 2	Control amp unit	TWG1002	× 1
◉ 3	Power amp unit	TWH1008	× 1
4	Mesh	TLL1206	× 1
5	Front panel	TNS1007	× 1
6	Side panel	TNS1006	× 1
7	Shield plate	TNA1185	× 1
8	Volume knob	TAA1003	× 3
9	Switch knob	TAA1004	× 1
10	Adhesive	TEB1043	× 4
11	Cushion	TED1044	× 1
12	Insulator	TNM1005	× 1
13	Packing	TEC1351	× 1
14	Packing	TEC1352	× 1
15	Baffle board assembly	TXK1221	× 1
16	Short cap	CNV1308	× 1
17	Cabinet	TLM1148	× 1
18	Screw	BMZ30P100FZK	× 3
19	Screw	BPZ40P100FMC	× 4
20	Screw	BPZ40P160FMC	× 10
21	Screw	BSZ40P120FZK	× 1
22	Screw	BBZ30P100FMC	× 16
23	Packing	TEC1353	× 1
24	Packing	TEC1354	× 1

Ⓐ : Adhesion portion



6. ELECTRICAL PARTS LIST

NOTES :
- Parts without part number cannot be supplied.
- Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5 %, and K = 10 %).
- 560 Ω → 56 × 10¹ → 561 ····· RD1/4PS 5 6 1 J
- 47k Ω → 47 × 10³ → 473 ····· RD1/4PS 4 7 3 J
- 0.5 Ω → 0R5 ····· RN2H 0 R 5 K
- 1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).
- 5.62k Ω → 562 × 10¹ → 5621 ····· RN1/4SR 5 6 2 1 F

◉CONTROL AMP UNIT (TWG1002)

P. C. Boards

Mark	Symbol & Description	Part No.
	VOLUME board	
	POWER INDICATOR board	
	CONTROL board	

VOLUME Board

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC5 – IC7	NJM2068S

SWITCH

Mark	Symbol & Description	Part No.
	SW1 (NOR/REV)	CSG-207

CAPACITORS

Mark	Symbol & Description	Part No.
	C15	CEA4R7M50L2
	C16,C26	CCCSL100J50
	C27,C28	CQMA332K50
	C34,C35	CEA101M10L2

RESISTORS

Mark	Symbol & Description	Part No.
	VR1,VR2 Volume (20kΩ)	TSH1004
	VR3 Volume (2kΩ)	TSH1003
	Other resistors	RD1/4PS□□□JL

POWER INDICATOR Board

SEMICONDUCTOR

Mark	Symbol & Description	Part No.
	D2 (POWER)	SLH-34VC5

CONTROL Board

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC1 – IC4,IC8	NJM2068S
	Q1,Q2,Q6	2SC2458
	Q3,Q4	2SA1048
	Q5	2SC2060
	D1	ERA15-02VH
	D3	RD9R1EB2
	D4 – D10	1SS176

COIL

Mark	Symbol & Description	Part No.
	L1 (0.1mH)	CZT2705

CAPACITORS

Mark	Symbol & Description	Part No.
	C1 – C4	CEA100M50L2
	C5,C6,C11,C12	CCCSL101J50
	C7 – C10	CEA2R2M50NPLL
	C13,C14	CEA100M50L2
	C19,C21	CQMA123K50
	C20,C22	CQMA562K50
	C23,C25	CEA220M50L2
	C24	CEA010M50L2
	C29,C30	CCCSL100J50
	C31,C33	CEA331M16L2
	C32	CEA101M10L2

RESISTORS

Mark	Symbol & Description	Part No.
	All resistors	RD1/4PS□□□JL

OTHERS

Mark	Symbol & Description	Part No.
	P2 Connector (4P)	TKS1015
	P1 Connector (DIN)	TKS1019
	P3,P4 Connector (3P)	TKS1023
	P5 Connector (4P)	TKS1024
	Cord (8P)	TDC1420
	Cord (2P)	TDC1422

6. ELECTRICAL PARTS LIST

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Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5 %, and K = 10 %).

560 Ω → 56 × 10¹ → 561 ····· RD1/4PS 5 6 1 J
47k Ω → 47 × 10³ → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10¹ → 5621 ····· RN1/4SR 5 6 2 1 F

◉CONTROL AMP UNIT (TWG1002)

P. C. Boards

Mark	Symbol & Description	Part No.
	VOLUME board	
	POWER INDICATOR board	
	CONTROL board	

VOLUME Board

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC5 – IC7	NJM2068S

SWITCH

Mark	Symbol & Description	Part No.
	SW1 (NOR/REV)	CSG-207

CAPACITORS

Mark	Symbol & Description	Part No.
	C15	CEA4R7M50L2
	C16,C26	CCCSL100J50
	C27,C28	CQMA332K50
	C34,C35	CEA101M10L2

RESISTORS

Mark	Symbol & Description	Part No.
	VR1,VR2 Volume (20kΩ)	TSH1004
	VR3 Volume (2kΩ)	TSH1003
	Other resistors	RD1/4PS□□□JL

POWER INDICATOR Board

SEMICONDUCTOR

Mark	Symbol & Description	Part No.
	D2 (POWER)	SLH-34VC5

CONTROL Board

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC1 – IC4,IC8	NJM2068S
	Q1,Q2,Q6	2SC2458
	Q3,Q4	2SA1048
	Q5	2SC2060
	D1	ERA15-02VH
	D3	RD9R1EB2
	D4 – D10	1SS176

COIL

Mark	Symbol & Description	Part No.
	L1 (0.1mH)	CZT2705

CAPACITORS

Mark	Symbol & Description	Part No.
	C1 – C4	CEA100M50L2
	C5,C6,C11,C12	CCCSL101J50
	C7 – C10	CEA2R2M50NPLL
	C13,C14	CEA100M50L2
	C19,C21	CQMA123K50
	C20,C22	CQMA562K50
	C23,C25	CEA220M50L2
	C24	CEA010M50L2
	C29,C30	CCCSL100J50
	C31,C33	CEA331M16L2
	C32	CEA101M10L2

RESISTORS

Mark	Symbol & Description	Part No.
	All resistors	RD1/4PS□□□JL

OTHERS

Mark	Symbol & Description	Part No.
	P2 Connector (4P)	TKS1015
	P1 Connector (DIN)	TKS1019
	P3,P4 Connector (3P)	TKS1023
	P5 Connector (4P)	TKS1024
	Cord (8P)	TDC1420
	Cord (2P)	TDC1422

◉POWER AMP UNIT (TWH1008)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC201	UPC1225H
	IC202	HD7402P
	Q201	2SC3422
	Q202	2SD718
	Q203	2SB688
	Q204,Q205	2SC2458
	Q206	2SA1048
	Q207	2SC2655
	Q208	2SA965
	Q209,Q210	2SC4131
	Q211 – Q213	2SC2001
	D201,D220,D221	1S1886
	D203,D204,D206,D207,D212,D213, D216 – D219	1SS176
	D205	RD9R1ES
	D209	03P2M
	D210	RD5R6JS
	D211	RD6R8JS
	D214	FMG22S
	D215	FMG22R

RELAY

Mark	Symbol & Description	Part No.
	RL201 Relay	TSR1002

COILS AND TRANSFORMERS

Mark	Symbol & Description	Part No.
	L201	CTF-167
	L202,L203 (1mH)	CZT2705
⚠	T2	CTH-061
⚠	T1	CTH-076

CAPACITORS

Mark	Symbol & Description	Part No.
	TH201	TCX-001
	C201	CEA4R7M16NPLL
	C202,C223,C224	CQMA473K50
	C203	CEA221M10L2
	C204	CCCSL330J50
	C205	CQMA683K50
	C207 (220μ/6,3)	TCH1101
	C209 – C211	CEA101M10L2
	C212,C219,C237	CEA331M16L2
	C213,C214,C218,C220,C238,C240, C242	CQMA104K50
	C215,C216,C232,C233 (2200μ/35)	TCH1099
	C217	CEA100M16LL
	C221	CQMA102K50
	C222	CQMA103K50
	C225,C228	CQMA332K50
	C226,C227	CQMA123K50
	C229,C230,C231	CEA102M16L2
	C235,C236,C239 EMI filter	CCG-081
	C241 (2200μ/16)	TCH1100
	C235,C236	CQMA474K50

RESISTORS

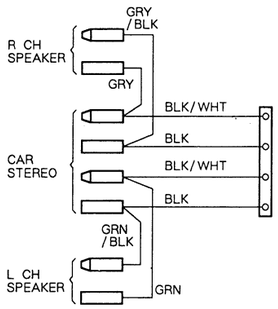
Mark	Symbol & Description	Part No.
	VR201 Semi-fixed (1kΩ)	CCP-324
	R208,R209,R228,R252	RS1V□□□JL
	R210,R211,R238,R239	RS2P□□□JL
	R253	RS1P□□□JL
	Other resistors	RD1/4PS□□□JL

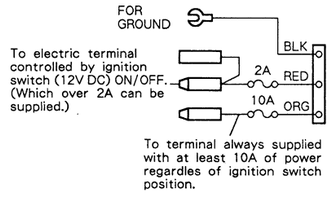
OTHERS

Mark	Symbol & Description	Part No.
	Bushing	TEB1130
	Bracket	TNA1187
	Insulator	TNM1003
	Insulator	TNM1004
	Cord	TDC1415
	Cord	TDC1416
	Cord	TDC1263
	Cord	TDC1419

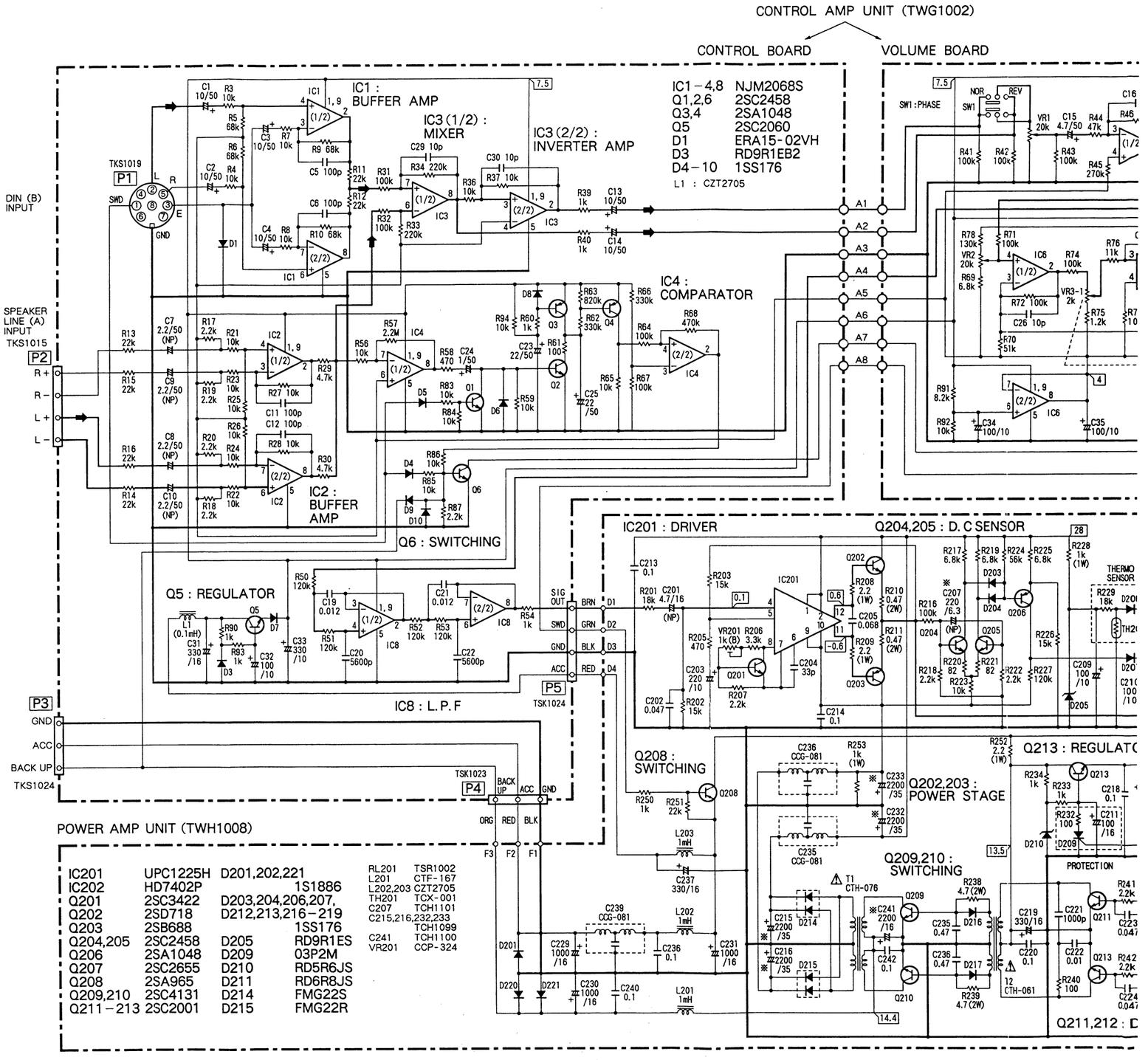
7. SCHEMATIC DIAGRAM

· Accessory cords





Note :
This connection is made to the accessory connector in the car's fuse unit from which over 2A can be supplied.
As to the other connections, refer to the section 3. CONNECTIONS (See page 2).



CONTROL AMP UNIT (TWG1002)

CONTROL BOARD

VOLUME BOARD

IC1 : BUFFER AMP

IC3 (1/2) : MIXER

IC3 (2/2) : INVERTER AMP

IC1-4,8 NJM2068S
Q1,2,6 2SC2458
Q3,4 2SA1048
Q5 2SC2060
D1 ERA15-02VH
D3 RD9R1EB2
D4-10 1SS176
L1 : CZT2705

IC4 : COMPARATOR

IC5 : BUFFER AMP

IC5-7 NJM2068S
SW1 CSG-207
VR1,2 TSH1004
VR3 TSH1003

SW1:PHASE

VR1:GAIN
VR2:WIDTH
VR3:FREQ

POWER INDICATOR BOARD

D2 SLH-34VC5

IC2 : BUFFER AMP

Q6 : SWITCHING

IC201 : DRIVER

Q204,205 : D.C SENSOR

THERMO SENSOR

Q5 : REGULATOR

IC8 : L.P.F

Q208 : SWITCHING

Q202,203 : POWER STAGE

Q213 : REGULATOR

IC202 : OSC

Q209,210 : SWITCHING

PROTECTION

Q211,212 : DRIVER

WOOFER 16-437AZ

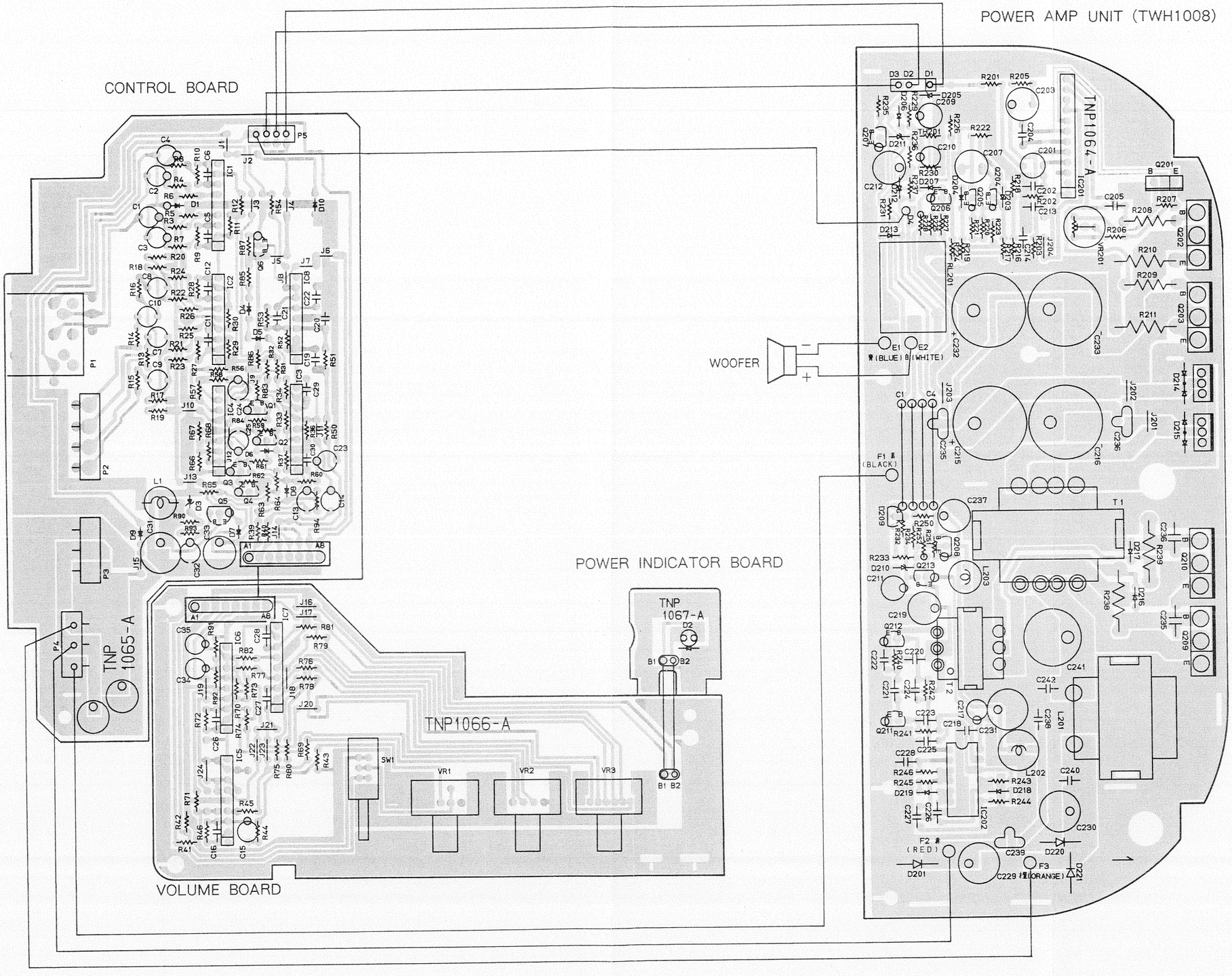
SP OUT

AMP UNIT (TWH1008)

	UPC1225H	D201,202,221	
	HD7402P		1S1886
.	2SC3422	D203,204,206,207,	
	2SD718	D212,213,216-219	
	2SB688		1SS176
205	2SC2458	D205	RD9R1ES
.	2SA1048	D209	03P2M
	2SC2655	D210	RD5R6JS
	2SA965	D211	RD6R8JS
210	2SC4131	D214	FMG22S
-213	2SC2001	D215	FMG22R

RL201	TSR1002
L201	CTF-167
L202,203	CZT2705
TH201	TCX-001
C207	TCH1101
C215,216,232,233	TCH1099
C241	TCH1100
VR201	CCP-324

8. P. C. BOARDS PATTERN



P. C. BOARDS PATTERN

This P. C. B. connection diagram is viewed from the foil side.